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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/882,100	06/15/2001	Arthur J. Carlson	13148US02	7713

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EXAMINER

PERILLA, JASON M

ART UNIT	PAPER NUMBER
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2611

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

09/882,100

Applicant(s)

CARLSON, ARTHUR J.

Examiner

Jason M. Perilla

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

1. Claims 1-22 are pending in the instant application.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. § 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-6, and 14-22 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding claim 1, the claim is not enabled by the specification because the specification does not enable one skilled in the art to make or use the claimed invention of forming symbols using **any** integer number of bits without undue experimentation. The specification does not enable a symbol to contain any number of bits. The maximum number of bits which may be contained within a symbol is a function of, among other things, the channel integrity, signal to noise ratio, channel fading, and channel crosstalk. Therefore, one skilled in the art is not enabled by the specification to form a symbol of, for instance, a million bits because such transmission rates are functionally and realistically not possible as understood by one having skill in the art without undue experimentation or otherwise.

Claims 2-6 and 21 are rejected as being based upon a rejected parent claim.

Claims 14-20 and 22 are rejected as being based upon a rejected parent claim.

4. Claims 13-20 and 22 rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claim 13, the claim, as amended, does not conform to one of the embodiments of figures 4-9. That is, the claimed second modem operable to determine its own maximum receive data rate with its own threshold and transmitting to a first modem instructions regarding the number of bits per symbol to be transmitted to itself is not an embodiment of the invention as originally filed and is considered new matter. The embodiments of the invention are as follows:

- a. Figures 4-6, a transmitter determines information regarding a data rate and compares it with a threshold at the side of the transmitter; the transmitter's own transmit rate (symbol size) is adjusted accordingly.
- b. Figures 7-9, a transmitter determines information regarding a received data rate from a remote receiver and compares it with a threshold; the remote receiver is queried by the transmitter with respect to a symbol size which should be transmitted by the transmitter.

The claimed embodiment which is new matter:

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- a. (Figure not shown) A receiver determines information regarding a data rate and compares it with a threshold at the side of the receiver; the receiver instructs a remote transmitter to adjust its transmit rate (symbol size) accordingly
2. Claims 14-20 and 22 are rejected as being based upon a rejected parent claim.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-22 are rejected under 35 U.S.C. § 103(a) as being unpatentable by Bremer in view of Dirschedl, and in further view of Gross et al (6,549,520; hereafter "Gross").

Regarding claim 1, Bremer discloses an ADSL system (abstract; col. 6, lines 45-55) for the transmission of high bit rate data services. Bremer does not disclose a method of restricting symbol size in an ADSL system. However, Dirschedl teaches a method of restricting symbol size in an system (abstract; col. 1, lines 40-55) comprising: obtaining information regarding the data rate during initialization (col. 2, line 63 – col. 3, line 9); comparing the information to a threshold (col. 3, lines 13-25); forming symbols (i.e. 2, 4 or 8 bit symbols) using a multiple of a predetermined number (i.e. 2) of bits if the information is above the threshold (col. 2, line 45); and allowing symbols to be formed using an integer number of bits per symbol if the information is below the threshold (col. 2, line 45). Dirschedl teaches a method wherein data is gathered at the

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side of a receiver regarding the current bit per symbol error rate (col. 2, lines 63-68) and the data is transmitted to a transmitter of the data. A success/fail determination or threshold is compared at the transmitter to determine the quality of the transmission (col. 3, lines 13-25). According to the success/fail determination, the number of bits per symbol is updated according to the possible bit rates of 2, 4, or 8 bits per symbol at the transmitter. As broadly as claimed, all of the possible bit rates disclosed by Dirschedl (col. 2, line 45) are both a multiple of 1 or 2 and an integer. Therefore, regardless of the decision based upon the threshold, either of the bit per symbol conditions (a predetermined number "multiple of 1 or 2" or an integer number) will be met. The method taught by Dirschedl is advantageous because it can be used to provide the maximum possible bit rate according to the capacity of the communications channel. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to modify the ADSL system of Bremer with the restricting symbol size method of Dirschedl because it can be used to provide the maximum possible bit rate according to the capacity of the communications channel.

Further regarding claim 1, Bremer in view of Dirschedl do not explicitly disclose that the information regarding a data rate *is a data rate*. Furthermore, Gross teaches that information regarding a data rate (or an error rate) is a known functional equivalent to a maximum receive data rate. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute information regarding a data rate (i.e. error rate) with a data rate as suggested by Gross (col. 4, lines 29-33) because determining the corollary between an error rate and a maximum

receive data rate would be within the level of ordinary skill in the art. That is, they are art recognized functional equivalents.

Regarding claim 2, Bremer in view of Dirschedl, and in further view of Gross disclose the limitations of claim 1 as applied above. Further, Bremer in view of Dirschedl, and in further view of Gross disclose the remaining limitations of the claim as applied to the rejection of claim 2 above in view of Bremer in view of Dirschedl taken alone.

Regarding claim 3, Bremer in view of Dirschedl, and in further view of Gross disclose the limitations of claim 1 as applied above. Further, Gross discloses that information regarding a data rate (or an error rate) is functionally equivalent to an estimated maximum receive data rate.

Regarding claims 4-6, Bremer in view of Dirschedl, and in further view of Gross disclose the limitations of claim 1 as applied above. Further, Bremer in view of Dirschedl, and in further view of Gross disclose the remaining limitations of the claim as applied to the rejection of claims 4-6 above in view of Bremer in view of Dirschedl taken alone.

Regarding claims 7-12, Bremer in view of Dirschedl, and in further view of Gross disclose the limitations of the claims as applied to claims 1-6 above.

Regarding claim 13, Bremer discloses an ADSL system (abstract; col. 6, lines 45-55) for the transmission of high bit rate data services. Bremer discloses a first modem (fig. 2, ref. 40) and a second modem (fig. 2, ref. 20) which each have a receiver and a transmitter as known by one having skill in the art (MODulate/DEModulate).

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Bremer does not disclose that the two modems achieve a maximum data rate between them. However, Dirschedl teaches a system wherein a transmitter and a receiver achieve a maximum data rate between them. Dirschedl teaches a transmitter which receives an error rate from a receiver which is indicative of a maximum receive data rate of a receiver and compares it to a threshold (col. 2, line 60 – col. 3, line 25) to select a number of bits per symbol based upon the comparison. Dirschedl teaches a method wherein data is gathered at the side of a receiver regarding the current bit per symbol error rate (col. 2, lines 63-68) and the data is transmitted to a transmitter of the data. A success/fail determination or threshold is compared at the transmitter to determine the quality of the transmission (col. 3, lines 13-25). According to the success/fail determination, the number of bits per symbol is updated according to a pre-selected number of bits per symbol (i.e. 1, 2, or 3) or an integer number of bits per symbol (i.e. 1, 2 or 3) as applied to claim 1 above. It is at least implied that, once a new bit per symbol rate is determined by the transmitter, the receiver of Dirschedl is instructed to communicate using the selected number of bits per symbol for the utility of the communications pair. The method taught by Dirschedl is advantageous because it can be used to provide the maximum possible bit rate according to the capacity of the communications channel. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to modify the ADSL system of Bremer with the restricting symbol size method of Dirschedl because it can be used to provide the maximum possible bit rate according to the capacity of the communications channel.

Further regarding claim 13, the ADSL system of Bremer in view of Dirschedl discloses a transmitter which receives an error rate from a receiver but does not explicitly disclose that the error rate is an estimated maximum receive data rate. However, Gross teaches that an error rate is an art accepted equivalent to a maximum achievable data rate as applied to claim 1 above. Therefore it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize an estimated maximum receive data rate rather than an error rate for updating transmission parameters because, as taught by Gross, they are art accepted equivalents as applied to claim 1 above.

Regarding claim 14, Bremer in view of Dirschedl, and in further view of Gross disclose the limitations of claim 13 as applied above. Further, Dirschedl discloses that the pre-selected number of bits per symbol based upon the comparison is one of a multiple of 1 (col. 2, line 45). The 2, 4, or 8 PSK modulation techniques correspond to 1, 2, or 3 bits per symbol respectively. Therefore, the pre-selected number of bits is 1. Bremer in view of Dirschedl, and in further view of Gross do not explicitly disclose that the pre-selected number of bits per symbol is one of a multiple of 2. However, the use of a "multiplier" of bits per symbol of greater than 1 (2, for instance) is not disclosed as being used to solve a particular problem or provide any particular advantage. Furthermore, one skilled in the art would find it obvious to use bit per symbol rates of 4, 8, 16, or 32 as is commonly performed in the art. Such bit rates would be "multiples of 2" and are obvious to one having skill in the art because they are well known bit rates.

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Regarding claim 15, Bremer in view of Dirschedl, and in further view of Gross disclose the limitations of claim 14 as applied above. Dirschedl discloses using a threshold or testing against a preset value to compare the information regarding the data rate (col. 3, lines 12-25). Dirschedl discloses the use of 2, 4, or 8 bits per symbol (col. 2, line 45) dependent upon the outcome of the threshold comparison and, depending upon the quality of the radio channel, bit rates from 900bits per second to 5400 bits per second (col. 3, lines 25-30). Bremer in view of Dirschedl do not disclose expressly that the threshold is 1Mbits per second or 250Kbits per second and transmitting symbols using a multiple of 8 bits per symbol if the information is above the threshold. However, at the time the invention was made, it would have been obvious to a person having ordinary skill in the art to utilize any one of a various number of thresholds and corresponding bit per symbol rates determined empirically. The Applicant has not disclosed that the particular claimed thresholds or corresponding bit per symbol rate provide an advantage, are used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with any of a various number of threshold levels and corresponding bit per symbol rates derived empirically because each transmission system may need to be tuned according to the capacity of the communications channel and the desired data rate of the system. Therefore, it would have been obvious to one of ordinary skill in this art to modify Bremer in view of Dirschedl to obtain the invention as specified in the claim.

Regarding claim 16, Bremer in view of Dirschedl, and in further view of Gross disclose the limitation of claim 14 above. Further, the additional limitations of claim 16 are disclosed by Bremer in view of Dirschedl as applied to claim 15 above. Here, the use of a threshold of 2Mbits per second or 500Kbits per second and transmitting using a multiple of 4 bits per symbol if the information is above the threshold is considered a matter of design choice as applied to claim 4 above.

Regarding claim 17, Bremer in view of Dirschedl, and in further view of Gross disclose the limitation of claim 14 above. Further, the additional limitations of claim 17 are disclosed by Bremer in view of Dirschedl as applied to claim 15 above. Here, the use of a threshold of 3Mbits per second or 750Kbits per second and transmitting using a multiple of 2 bits per symbol if the information is above the threshold is considered a matter of design choice as applied to claim 4 above.

Regarding claim 18, Bremer in view of Dirschedl, and in further view of Gross disclose the limitations of claim 14 as applied above. Further, Dirschedl discloses that the transmissions errors are recorded using the CRC code (col. 2, lines 59-63) and send to the transmitter (col. 2, lines 65-68). As broadly as claimed, the number of transmission errors send by the receiver to the transmitter is considered to be a training signal.

Regarding claim 19, Bremer in view of Dirschedl, and in further view of Gross disclose the limitations of claim 14 as applied above. Further, Dirschedl discloses that the error rate transmitted from the receiver is compared with the threshold (col. 3, lines 13-25). The error rate received from the receiver is considered to be an estimate of the

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maximum receive data rate of the receiver because it describes if the receiver is receiving too much or possibly too little data. The error rate, or estimated maximum receive data rate, is compared with the threshold.

Regarding claim 20, Bremer in view of Dirschedl, and in further view of Gross disclose the limitations of claim 14 as applied above. Further, it is implied in the system of Bremer in view of Dirschedl by the teachings of Dirschedl that the first modem will adjust the data rate of the transmitter according to the threshold comparison of the second modem. One skilled in the art understands that both a receiver and a transmitter must be using the same data rate and bit per symbol rate for the utility of the data communications. Further, it is implied that a manager or system hardware would effect the use of the correct number of bits per symbol.

Regarding claims 21 and 22, Bremer in view of Dirschedl, and in further view of Gross disclose the limitations of claims 1 and 7 as applied above. Further, Dirschedl discloses that the pre-selected number of bits per symbol based upon the comparison is one of a multiple of 1 (col. 2, line 45). The 2, 4, or 8 PSK modulation techniques correspond to 1, 2, or 3 bits per symbol respectively. Therefore, the pre-selected number of bits is 1. Bremer in view of Dirschedl, and in further view of Gross do not explicitly disclose that the pre-selected number of bits per symbol is one of a multiple of 2. However, the use of a "multiplier" of bits per symbol of greater than 1 (2, for instance) is not disclosed as being used to solve a particular problem or provide any particular advantage. Furthermore, one skilled in the art would find it obvious to use bit per symbol rates of 4, 8, 16, or 32 as is commonly performed in the art. Such bit rates

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would be "multiples of 2" and are obvious to one having skill in the art because they are well known bit rates.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Perilla whose telephone number is (571) 272-3055. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jason M. Perilla
March 6, 2007

jmp


CHIEH M. FAN
SUPERVISORY PATENT EXAMINER